

Imaging of Historical Documents Improving our Service Delivery

The Division's mission includes collecting, protecting and disseminating valuable water records and information. Many of these records are over 100 years old and are in fragile condition. In 1998, the Division embarked on a mission to image all of the well permit documents and store them in a database that allows fast and easy retrieval. Document Imaging is a technology that scans pieces of paper into a digital photo that can have an index associated with it. The image can then be stored as data in a database, retrieved, and viewed on the computer screen. In January 1999, DWR de-

veloped the Imaging system, and in November began the arduous task of scanning 4.5 million pieces of paper. To date, all non-exempt well permits have been imaged, approximately 2.5 million documents, and the exempt permits are currently being imaged. The goal is to have all well permits imaged by January 2001.

The next step is to make these documents available on DWR's web site. The building of the web pages was completed two weeks ago and the sites are being tested now. These large files are pushing the limit of the bandwidth, making

the retrieval from remote sites slow. These issues are currently being worked on with the hope of launching this site soon.

What does this mean to the public? Faster response time to requests for information, faster evaluations of well permit applications, and protection of valuable permits. In addition, once these are available on the web, the public will no longer have to come to Denver to look at well permits, resulting in saving time and money.

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Revised BOE Rules in Effect June 1, 2000

The revised Rules and Regulations for Water Well Construction, Pump Installation, and Monitoring and Observation Hole/Well Construction (Water well Construction Rules) were in effect as of June 1, 2000. The revised Rules apply to any and all wells, monitoring or observation holes/wells and pump installation completed after June

1, 2000. The Board of Examiners has directed the staff to provide training sessions on the revised rules during the next six months. The first of these training sessions was held in Pueblo and Alamosa in late June. An additional session was held at the CWWCA mid-year conference in Glenwood Springs July 21, 2000.

The training sessions include a brief overview of the significant changes in the rules and an open discussion on contractor's concerns.

Additional information regarding the Rules may be obtained by contacting Jack Byers or Dave McElhanehy at the Division of Water Resources.

Enforcement Activities in Water Division 1 Continue

During 1999, Division I continued the major effort to locate illegal uses of wells and illegal surface water diversions. This effort has been focused at the Big Thompson River (District 4) from the western edge of the city limits of Loveland upstream to the Eastern Boundary of Rocky Mountain National Park. This office also looked along the St. Vrain River (District 5) from the Town of Lyons to its headwaters and along the Left Hand Creek Drainage from its confluence with St. Vrain Creek to its' headwaters.

In the Big Thompson drainage, many people have submitted change of ownership requests for their wells and have obtained forms to late register their historic uses of pre-1972 wells. Over 140 persons have joined a substitute supply plan call WAR that involves the use of CBT to replace water being diverted directly from the Big Thompson River. In addition, commercial water users and others have joined a substitute supply plan for the Big Thompson River that will replace depletions associated with illegal well usage. This plan developed by the



Continental Water Bank will eventually be taken to water court. Many people have chosen to cease the watering of their lawns instead of augmenting for out-of-priority uses. We are watching potential violators closely and in the 1999 water year we only found one person who attempted to irrigate without joining any plan. We contacted that person and they ceased diverting water. During 2000, this office will issue cease and desist orders to any individuals who have not joined one of the plans and continue the illegal use of their wells or surface water diversions.

As a result of 1998-1999 efforts, the number of parties participating in the substitute supply plan that is operated by the Left Hand and St. Vrain Water Conservancy District has increased to 140. This project has been getting positive results in eliminating illegal water usage. The water commissioner will continue monitoring water users who are illegally diverting water. This will primarily involve our following up on last year's contacts and issuing cease and desist orders if needed. It is planned that during 2000 the water commissioner will look downstream of Lyons for similar illegal water uses.

Low Flows, Even in Water Division 6

Division 6, which includes the Yampa, White and North Platte River drainages, is normally considered an area of abundant water. However, that is not the case this year. Along with the rest of the state, Division 6 is experiencing streamflows that are well below normal. Many irrigators have been without water since the end of the runoff. Recreation interests have suffered from the short runoff season as well as the current low flows.

At the end of the winter season, the

snowpack in Division 6 was among the highest in the state. In April and May, high temperatures, winds and below normal precipitation reduced the snowpack significantly. As a result, runoff peaked at the end of May and streamflows have been declining steadily ever since. Streamflows are now approaching levels last seen in 1994, which was the last moderately dry year in the Division. While these low flows have been caused some hardships, especially on the smaller tributaries, the water supply is still

good. After a string of six years of average or above-average runoff, it's sometimes hard to cope with the reality of a dry year. As ranchers get ready to start harvesting their hay crop demands for irrigation, water should decrease and flows in the rivers will hopefully rise. While the promise of the annual "monsoon" season is heard from all quarters, rainfall continues to be below average and the afternoon temperatures remind one of living on the front range.

The "Improved" GPS

On May 1, 2000, President Bill Clinton ordered that Selective Availability (SA), the intentional degradation of GPS signals, be discontinued.

This long hoped-for action resulted in immediate improvement in accuracy of all GPS units. In the past, GPS signals were either real-time or post-collection processed by a method referred to as "Differential Correction" in order to mitigate SA and improve accuracy. DGPS is the acronym used to describe GPS data that has been improved by the process of "Differential Correction." Differential Correction typically results in tenfold improvements to point position accuracies. Discontinuance of SA doesn't produce results as improved as Differential Correction, however fivefold reduction of offset may be expected.

For example, a benchmark position, checked before SA was discontinued provided a position determination which was offset by 29.4 meters. After SA was shut off, a recheck of the benchmark was within 5 meters offset. In both measurements "averaging" was utilized, which improved the accuracy in both cases.

Although accuracy has been enhanced, some problems are unimproved by the

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discontinuance of SA. For example, multipath, the problem of reflected signals, may occur in steep-sided valleys and canyons. Nearby buildings or high vertical structures can cause errors due to a reflected signal. As a rule, trees present no problem.

GPS units can, of course, be used to define point positions, lines or areas. The discontinuance of SA improves lines and areas to some degree. However, the best resolution for lines and areas is still obtained by DGPS techniques.

The Colorado Division of Water Resources will be changing well permit application forms in the near future to include GPS coordinates. The GPS position should be referenced to the UTM (Universal Transverse Mercator) coordinate system. Unlike latitude and longitude positioning, UTM positioning is a rectilinear grid with uniform scale

(meters) from south to north (Northing) and meters from west to east (Easting) directions. UTM in Colorado can all be expressed within zone 13, which means any point in Colorado will be y meters "Northing" and x meters "Easting." USGS Topographic maps from the mid-60's on have the UTM coordinates around the edges.

To submit GPS location data with a well permit application, keep in mind:

- UTM coordinates (meters Northing and meters Easting).
- Use NAD 27 CONUS datum (most Colorado Quadrangle maps use this datum – see lower left-hand corner of the map).
- "Average" the position for improved accuracy.
- Be aware of structures that may receive a reflected signal, i.e., "multipath."
- Finally, take a second position reading to compare results to the first.

GPS accuracy of virtually all units has never been as good as it is now. Enjoy the newfound accuracy of position determinations by GPS (the Global Positioning System).

U.S. Forest Service Negotiations

The Division 7 water resource engineers have continued assisting and participating in the Technical Subcommittee of the negotiating team in addressing the 1976 claims filed by the U.S. Forest Service. Recently, the Federal Government and the water users came to terms in the Division 3 (Rio Grande) cases and signed a stipulated settlement. However, the impacts of the claims in Divisions 2 and 7 could have much more significant negative impacts on users. Specifically, in southwestern Colorado, the ability of the state to develop its total Colorado Upper

Basin allotment under that Compact could be impaired by removing wholesale areas from access by users if in-stream flow claims in downstream locations are granted. The Forest Service has an opportunity to secure more than the channel maintenance flows found in State Supreme Court cases to be the original intent of the reservation.

In some drainage reaches, most of the water is available for claims. In other areas, the existence of other water rights and possible need for further develop-

ment means that any water rights which might be approved should be substantiated and quantified. Discussion between Division staff, the CWCB, the water user group representatives, and Forest Service hydrologists has allowed for a better understanding of the issues and is hoped to lead to agreements on at least some of the stream segments which are key to the Forest Service claims. A decree which presents finality in the reserved rights claims will be beneficial to the majority of the citizens and water users in the San Juan/Dolores River Drainage.

Water Delivery Agreement for Endangered Fishes

On June 30, 2000, an amendment was signed that continued a 1995 Memorandum of Agreement amount the Bureau of Reclamation, the United States Fish and Wildlife Service, and the Colorado Water Conservation Board for furnishing water from the Wayne N. Aspinall Unit for the benefit of endangered fishes. The agreement is part of a multi-state effort in the Recovery Implementation Program for the Endangered Fish Species in the Upper Colorado River Basin.

The parties originally entered the water delivery agreement to protect Aspinall Unit releases during the months of July, August, September, and October, as necessary to provide a minimum flow in the Gunnison River for the study of endangered fishes and their needs and for fish passage purposes around the Redlands

Diversion Dam. A Fish Ladder was constructed in 1996 that allows endangered fish to travel around the Redlands Diversion Dam and continue their journey upstream. The releases also provide flows for the reach of the Gunnison River below the Redlands Diversion Dam down to the confluence with the Colorado River in case the flow falls below 300 cfs. The releases are from water stored in the Aspinall Unit for the depletive effects of two other Reclamation projects, Dolores and Dallas Creek. Aspinall releases shall be subject to such transit losses as may be imposed by the State Engineer or the Division Engineer for Water Division 4.

An interesting clause in the contract states that "these releases shall completely remove the need for administra-

tive calls by downstream Gunnison River mainstem users senior in priority to the Aspinall Unit, unless such releases would cause Blue Mesa Reservoir to drop below 400,000 acre feet of total storage at the end of the current calendar year". Administratively, this clause effectuates that during the months of July through October, the Aspinall Unit shall also release enough water required to meet senior calls, most likely coming from the Gunnison Tunnel and the Redlands Canal. In a dry year, this could be a substantial benefit for these water rights.

The Agreement was only meant to be used in the interim until the conclusion of Section 7 consultation on Aspinall Unit operations and issuance of a final biological opinion by the US Fish and Wildlife Service were completed.

Green Mountain and Reudi Reservoir Operations

For the purposes of improving the endangered fish habitat during the past few years, the major reservoir operators have worked together on the Colorado River mainstem to enhance the snowmelt peak flows in the "15 mile reach" near Palisade. Very little of this reservoir re-operation was done May and June due to risk of not recovering all the for-gone storage on the falling limb of the hydrograph.

The USBR has contracted the U.S. Navy Seals to do some repair work on the outlet at Green Mountain Reservoir. They are scheduled to be completed on August 17, at which time half the outlet capacity will be available. Initially, releases at Green Mountain will be done through the spill gates. The storage pool above the sill of the spill gates is 42,000 acre-

feet. Once the lake elevation drops below the sill of the spill gates, which should be well after August 17, releases will be done through one of the two outlet tubes. This limits releases to a maximum of approximately 750 cfs.

With all our major reservoirs full or near full, on Friday, July 14, the Division 5 office was bracing for a river call within the next few days. Fortunately, some timely rains have delayed the call for at least one week with more rain in the forecast. All this brings some relief from testing the 42,000 acre-feet and then the 750 cfs limitations later this irrigation season. But, should this outflow limitation at Green Mountain become an issue, the Colorado River Water Conservation District has informally agreed to attempt to

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make up shortages at Green Mountain Reservoir from Wolford Mountain Reservoir.

Since the end of the snowmelt run-off, outflows at Ruedi Reservoir have been kept below 250 cfs, the maximum desirable level for fishermen on the Fryingpan River. Releases of 50 cfs from the USFWS pool brought total outflow up to 230 cfs, but with recent rains this release will be temporarily halted.

Rio Grande Decision Support System Update

Progress is continuing on Phase 1 and 2 of the Rio Grande Decision Support System (RGDSS). As of April 30, 2000, the status of development in the five separate components by the contractors is as follows:

- The *Surface Water* component, by Hydrosphere Resource Consultants, is 65 percent complete.
- The *Ground Water* component, by HRS Water Consultants, Inc., is 45 percent complete.

- The *Consumptive Use/Water Budget* component, by Leonard Rice Consulting and Agro Engineering, is 80 percent complete.
- The *Relational System Integration* component, by Riverside Technology, Inc., is 72 percent complete.
- The *Spatial System Integration* component, by HDR Engineering, Inc., is 95 percent complete.

In addition to the consultant activities

described above, the USGS continued to perform geophysical logging on the RGWCD's existing confined observation well network. Technical meetings on consumptive use, surface water modeling, well construction and ground water modeling were conducted in Alamosa from January 11-13, 2000.

For additional and up-to-date information regarding RGDSS, see the website at cdss.state.co.us.

Human Resources

New Employees

Jana Ash started with the Division on May 1, 2000, as a Water Resource Engineer and is working for both the Modeling and Hydrography Branches. Jana graduated from Michigan Technological University with a degree in Civil Engineering. Prior experience includes Harmon Contract in Kansas City, MO, as construction project manager, and Rose Systems in Englewood, CO, managing and supervising construction of conceptual designs/solutions for clients.

Phil DeArcos started employment on May 1, 2000, as a Visual Basic Programmer and is part of the software development team in the Information Technology Branch. He came to the Division from Rocky Mountain Remediation Services, a firm that performs environmental remediation work, and was a program manager for the Rocky Flats surface water remote data monitoring system.

Doug Wist started on June 5, in the Division 4 office in Montrose as a Water Commissioner overseeing the Ward, Kiser and Young Creek drainages. Doug has worked in the real estate business and the construction business in the Cedaredge area for several years.

Jennean (Jen) McKinney started in May as an Administrative Assistant in the Records Section where her duties include researching, interpreting and/or copying historic documents for the public, and maintaining many different types of files that deal with well permits, water rights, and diversion records. Jen brings many years of office and public service experience to the Division.

Dawn Ewing started on June 12 as an Administrative Assistant in the Division 1 office in Greeley. Some of her duties will include answering the telephone, researching records, filing, and assisting the public. She brings over nine years of administrative experience in water and wells from R.A. & T Enterprises (formerly R & R Well and Pump) to the Division.

Suzanne Sellers joined the Division on June 26, 2000, to fill the Professional Engineer position in the Designated Basins Branch. She will be involved in permitting duties within the Basins. Suzanne has seven years experience in the Environmental Engineering field and managed or participated in several remedial projects for Air Force, Army, and Navy clients.

David Ellington started on June 28, 2000, as a Water Resource Engineer in the Greeley office. David has a Bachelor Degree in Agricultural Engineering, an MS in Civil Engineering, and has partly completed his PhD work. He is an EIT and has extensive computer background including GIS experience. Most recently, David worked at CSU in the Environmental Health Advanced Systems Lab.

Retirements


Jack McHugh retired on June 2, 2000, from his job as water commissioner on the Ward, Kiser, and Young Creek systems on the south side of Grand Mesa. Jack started his water commissioner duties in the spring of 1972. Jack will continue to be a source of water information for the division as well as for the local people around Cedaredge.

Kent Swedlund retired from state service as a permanent employee effective June 1, 2000. Kent has been with the state since April 15, 1976 as the deputy water commissioner in District 64, the lower end of South Platte River. He is also retiring as a school teacher in the Sterling School system. Kent will continue to work for the Division as a temporary employee.

Don Gabriel retired from state service effective August, 2000. Don has been with the state since June, 1979, as a deputy water commissioner in District 1, the South Platte River between Kersey and the western boundary of Washington County. Don is also retiring as a school teacher in the Brush School system.



CALENDAR OF EVENTS:

- August 1** Board of Examiners of Water Well Construction and Pump Installation Contractors, Denver, CO; for more information, contact Gina Antonio at 303-866-3581
- August 18** Colorado Ground Water Commission Meeting, Breckenridge, CO; for more information, contact Marta Ahrens at 303-866-3581
- September 25-26** Colorado Water Conservation Board Meeting, Canon City, CO; for more information, contact Susan Maul at 303-866-3441
- October 12-13** Colorado Water Officials Association Annual Meeting, Holiday Inn Lakewood, CO; for more information, contact Dick Wolfe at 303-866-3581
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<http://water.state.co.us>

STREAM LINES is published by the Colorado Division of Water Resources on a quarterly basis. Subscriptions are available for \$10 per year to cover the cost of printing and mailing.